Title: Pre-hospital identification and post-recovery challenges of intoxication with synthetic cannabinoid containing legal high products such as 'Exodus damnation'.

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Abstract

This short report describes the case of a young adult male who had smoked a synthetic cannabinoid legal high product called 'Exodus Damnation'. The patient's presentation was atypical from that described in the literature, with hypotension and hypoxaemia. Of note was the rapid recovery after prehospital intervention with high flow oxygen therapy and intravenous fluids. The patient refused on going care, despite repeated advice to attend the Emergency Department. The distinct lack of specialist support and referral to drug treatment for this patient population, with whom ambulance services are coming into contact with increasing frequency, is reported. For those patients with the capacity to refuse on-going care, ambulance services may be in an opportune position to actively promote referral to support services for these vulnerable individuals.

Key words: Legal high, new psychoactive substances, Exodus damnation, synthetic cannabinoid, 5F-AKB48 and 5F-PB22.

Introduction

We report the case of an 18-year-old male found in a collapsed state after smoking a legal high product known as 'Exodus Damnation', which has previously been associated with serious adverse events and shown to contain potent synthetic cannabinoid receptor agonist drugs such as 5F-AKB48 and 5F-PB22. (1)

Case presentation

The ambulance service attended an emergency call to a homeless drop-in centre after an 18-year-old male was found collapsed after reportedly smoking a legal high product called 'Exodus Damnation'. The male was found seated, slumped over a table. On initial assessment he was pale and unresponsive (U), on the AVPU scale for assessing responsiveness (Alert, responds to Verbal stimuli, responds to Pain, Unresponsive), with slow, shallow breathing and an absent radial pulse.

There was no indication of trauma and so to facilitate examination and treatment the patient was immediately repositioned supine on the floor. His airway was unobstructed, respiratory rate was 10-12/min with oxygen saturations reading 91% on air. High flow oxygen was administered at 15 litres/min via a non-rebreathing mask. Despite this postural change there remained no radial pulse and a prolonged (>2 seconds) capillary refill. A manual blood pressure measurement was attempted but ambient noise levels prevented any reading.

During the disability assessment he remained unresponsive, with pupils dilated (blood shot) but reactive, blood glucose measured 6.2 mmol/l. His temperature was 36.4^{o}c, H.R. 100 – 110 bpm. A subsequent electronic blood pressure measurement of 87/50 mmHg prompted the

rapid placement of an intravenous cannula followed by a 250ml bolus of sodium chloride. Before administration of the fluid a 12 lead ECG was recorded which was unremarkable.

In response to the oxygen therapy and fluid bolus the patient's condition improved; oxygen saturation increased to 98% and systolic blood pressure to 101 mmHg. The patient recovered becoming fully alert and orientated within approximately 2 minutes, subsequently refusing further assessment, treatment and transportation to the Emergency Department, despite repeated and prolonged efforts to encourage this.

Discussion

Recent reports suggest the number of new psychoactive substances (NPS) has been increasing annually since 2009. (2, 3) In Scotland, during 2013, 113 deaths were recorded where NPS were involved, 60 where they were implicated in or potentially contributed to death; 16.5% of all drug related deaths. (4) None of these deaths were directly related to synthetic cannabinoids, however post-mortum detection and correlation with these substances can be problematic. (2) There is an acknowledged limited evidence base on their toxic effects or care required. (1, 2 & 4) There are a two key points in this case worthy of discussion.

Firstly, synthetic cannabinoids exert their actions on the central CB1 and/or peripheral CB2 cannabinoid receptors. (5) The CB1 receptor being responsible for the psychotropic effects and CB2 as immune modulators. (5) Patients may present with reduced consciousness, palpitations, agitation, seizures, headache, chest pain, sweating, hypertension and delusions. However, with the exception of reduced level of consciousness, most of the common adverse effects associated with synthetic cannabinoids were absent in this case. (5, 6) This atypical presentation caused uncertainty in determining the precise cause of collapse. A small non-

representative prevalence study conducted online in Scotland in 2014 found that 120 (17%) of the 657 respondents reported direct experience of NPS (having tried NPS previously or take it currently). Of these, 26 % reported always (and 32% usually), using them alongside other substances; most commonly alcohol, cannabis or cocaine (7). Whilst alternative substances may have contributed to the atypical presentation in the current case, the patient denied their use. Alternatively, it is recognised that the uncontrolled, haphazard manufacturing process of legal high products may cause uneven distribution of the active substance on the herbal material in some batches. (8) The potency of the substances present may therefore have contributed to this abnormal presentation.

Secondly, the patient refused transportation to the ED. Professional advice was sought from the local Emergency Department and Toxbase via Ambulance Control as it was recognised that these substances can have prolonged (several hours) and potentially life-threatening consequences. (4, 5) Both sources advised that the patient should be transported to the ED via ambulance for a period of observation. Despite informing the patient of these risks on-going care was persistently declined. This was of significant concern to the attending ambulance clinicians who felt there was no viable alternative care pathway.

It is often the case that neither the individual who has been intoxicated by NPS, nor those treating them, are certain of the nature of the substance consumed. In this case, the systematic approach to pre-hospital assessment and treatment permitted the initial adverse features to be identified and treated effectively. (8) However, the successful treatment and rapid recovery permitted a prompt refusal of further care. This was despite persuasive attempts by the attending ambulance clinicians to follow-up their care at the ED. Therefore it is notable that for some individuals, ambulance clinicians are the only health care professionals

with whom they have contact and this should be recognised as an opportunity for intervention. Where such a refusal is made, follow-up care practices are brought sharply into focus, particularly where evidence exists to suggest a risk to the patient. (2, 4 & 5) There is some evidence that suggests a negative experience of NPS use may reduce the likelihood of future use. (7) Therefore, ambulance services may be in a unique position to capitalise on these negative experiences through appropriate encouragement of referral to primary care or provision of drug education advice. It is perhaps a good time to re-examine existing referral practices for this, and similar, patient populations.

Conclusion

- Prehospital care clinicians must remain vigilant for the unusual presentations of NPS intoxications and be aware of this phenomenon.
- Where presentations are atypical, it is essential that a systematic approach to assessment and treatment should be retained. I
- t has been identified that negative experiences of NPS may reduce future use. For those patients with the capacity to refuse on-going support, ambulance services may be able to actively promote referral to support services for these potentially vulnerable individuals.

Declaration of Conflicting Interests: The Authors declare that there is no conflict of interest.

Contributions: DF and PO attended the incident. All three authors contributed to the writing and review of this case report. AC provided expert advice, additional literature, for discussion.

Consent: Despite Caldecott approval being granted, it was not possible to locate the patient and gain consent and so in place of this the authors have anonymised the content.

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